CLAIMS

1. An anode of a power generation cell for a solid oxide fuel cell, comprising:

B-doped ceria particles that are separately attached to a frame surface of porous nickel having a network frame structure,

wherein B is at least one of Sm, Gd, Y, and Ca.

2. The anode of claim 1,

wherein the B-doped ceria particles comprise: large diameter ceria particles having an average particle size of 0.2 to 0.6 μm that are separately attached to a frame surface of porous nickel having a network frame structure, and small diameter ceria particles having an average particle size of 0.01 to 0.09 μm that are separately attached between the large diameter ceria particles.

3. The anode of claim 1,

wherein the B-doped ceria particles are expressed by a formula of $Ce_{1-m}B_mO_2$, and

wherein m is between 0 and 0.4.

4. A power generation cell for a solid oxide fuel cell, comprising:

an electrolyte which is formed of a lanthanum gallate-

based oxide ion conductor;

a porous cathode which is formed on a side of the electrolyte; and

a porous anode which is formed on another side of the electrolyte,

wherein the anode is that of claim 1.

5. The power generation cell for the solid oxide fuel cell according to claim 4,

wherein the lanthanum gallate-based oxide ion conductor is expressed by a formula of $La_{1-X}Sr_XGa_{1-Y-Z}Mg_YA_ZO_3$, and

wherein A is at least one of Co, Fe, Ni, and Cu, X is 0.05 to 0.3, Y is 0 to 0.29, Z is 0.01 to 0.3, and Y+Z is 0.025 to 0.3.

6. A solid oxide fuel cell comprising the power generation cell for the solid oxide fuel cell according to claim 4.

7. A power generation cell for a solid electrolyte fuel cell, comprising:

a solid electrolyte which is formed of a lanthanum gallate-based oxide ion conductor;

a porous cathode which is formed on a side of the solid electrolyte; and

a porous anode which is formed on another side of the solid electrolyte and comprises:

a sintered body of B-doped ceria expressed by a formula of $Ce_{1-m}B_mO_2$ and nickel, B-doped ceria particles are separately attached to a frame surface of nickel having a porous frame structure in the sintered body, the sintered body having a nickel composition gradient so that a nickel content is increased in a thickness direction, such that the nickel content of an innermost surface of the sintered body that is in contact with the solid electrolyte is 0.1 to 20 vol%, and the nickel content of an outermost surface of the sintered body that is farthest from the solid electrolyte is 40 to 99 vol%, and

wherein B is at least one of Sm, Gd, Y, and Ca, and $0<m\leq0.4$.

8. The Power generation cell of claim 7,

wherein the sintered body includes a plurality of layers having different nickel contents and in which B-doped ceria particles are separately attached to a frame surface of nickel having a porous frame structure.

9. The power generation cell of claim 8:

wherein the anode further includes an intermediate layer, which is formed between the innermost and the outermost layers and has at least one layer that is layered so that the nickel content is continuously or intermittently increased in the direction from the innermost layer to the outermost layer.

10. The power generation cell of claim 7 wherein the B-doped ceria particles include large diameter B-doped ceria particles having an average particle size of 0.2 to 0.6 μm which are separately attached to the frame surface of nickel having a porous frame structure, and small diameter B-doped ceria particles having an average particle size of 0.01 to 0.09 μm which are separately attached between the large diameter ceria particles.

11. A power generation cell for a solid electrolyte fuel cell, comprising:

a solid electrolyte which is formed of a lanthanum gallate-based oxide ion conductor;

a porous cathode which is formed on a side of the solid electrolyte; and

a porous anode which is formed on another side of the solid electrolyte,

wherein the anode includes a sintered body of B-doped

ceria expressed by a formula of $Ce_{1-m}B_mO_2$ and nickel, the sintered body including a plurality of layers having different nickel contents and in which large diameter ceria particles are separately attached to a frame surface of nickel having a porous frame structure and small diameter ceria particles are separately attached between the large diameter ceria particles, and the layers include an innermost layer, which is in contact with the solid electrolyte and has a nickel content of 0.1 to 20 vol%, and an outermost layer, which is separated from the solid electrolyte at least by the innermost layer and has a nickel content of 40 to 99 vol%, and

wherein B is one or more of Sm, Gd, Y, and Ca, and $0<m\leq0.4$.

12. The power generation cell of claim 11 wherein the anode includes at least one intermediate layer, which is layered so that the nickel content is increased in the direction from the innermost layer to the outermost layer which is farthest from the solid electrolyte.

13. The power generation cell for the solid electrolyte fuel cell according to claim 8 wherein a thickness of the innermost layer is 0.5 to 5 μm, and a thickness of the outermost layer is 10 to 50 μm.

14. The power generation cell for the solid electrolyte fuel cell according to claim 7, wherein the lanthanum gallate-based oxide ion conductor is expressed by a formula of $La_{1-X}Sr_XGa_{1-Y-Z}Mg_YA_ZO_3$, and

wherein A is one or more of Co, Fe, Ni, and Cu, X is 0.05 to 0.3, Y is 0 to 0.29, Z is 0.01 to 0.3, and Y+Z is 0.025 to 0.3.

15. A solid electrolyte fuel cell comprising the power generation cell for the solid electrolyte fuel cell according to claim 7.

16. The power generation cell for the solid electrolyte fuel cell according to claim 11 wherein a thickness of the innermost layer is 0.5 to 5 μm, and a thickness of the outermost layer is 10 to 50 μm.

17. The power generation cell for the solid electrolyte fuel cell according to claim 11, wherein the lanthanum gallate-based oxide ion conductor is expressed by a formula of $La_{1-X}Sr_XGa_{1-Y-Z}Mg_YA_ZO_3$, and

wherein A is one or more of Co, Fe, Ni, and Cu, X is 0.05 to 0.3, Y is 0 to 0.29, Z is 0.01 to 0.3, and Y+Z is 0.025 to 0.3.

18. A solid electrolyte fuel cell comprising the power generation cell for the solid electrolyte fuel cell according to claim 11.

19. The power generation cell of claim 7 wherein the nickel composition gradient is such that the nickel content increases continuously from the innermost surface to the outermost surface.